

A photograph of a person's hands holding a bunch of fresh carrots. The person is wearing a blue and white plaid shirt. The background shows a vast field of green crops under a clear sky. The image is partially overlaid by a dark blue diagonal band on the right side and a light green diagonal band on the top left.





## ANTIFOAM & FOOD SOLUTIONS

with power against foaming

## PROCESS CHEMICALS

for food and related industries

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## PROCESS CHEMICALS FOR THE FOOD INDUSTRY

Industrial applications often lead to undesired foam during various processes. Foaming is usually caused by organic or inorganic substances extracted through manufacturing. LEVACO has a wide range of different antifoaming agents which aim to destroy, prevent or manage the foam, regardless of your process.

Deposits that form on the heat transfer surfaces reduce energy efficiency. Our antiscalants ensure an even and permanent heat transfer. This effectively reduces energy consumption, saves CO<sub>2</sub> and costs. If organic or inorganic deposits are already formed, our cleaners are used for recovery to effectively transfer heat.

For the optimal application of our process chemicals, our team always works in close contact with our customers in order to offer customized and efficient solutions for the specific requirements of industrial processes.



Our products are approved as auxiliaries for the food industry. They comply with the relevant EU, EC, BfR and FDA regulations and are kosher and halal certified.

# SUGAR PRODUCTION

## FOAMING ISSUES DURING SUGAR PRODUCTION

During the sugar production process, impurities coming from the soil and the beet can contribute to increased foaming. The foaming causes undesired bottlenecks in production as:

- higher energy costs
- limited transportation of the sugar juice
- decreased tank capacity
- material loss
- inefficient settling
- slower evaporation and crystallization process resulting in higher energy consumption
- extra downtime due to cleaning of equipment

## SCALING DURING SUGAR PRODUCTION

Scaling occurs during sugar production due to the precipitation of calcium salts or silicates, especially during evaporation. The formation of deposits has the following drawbacks:

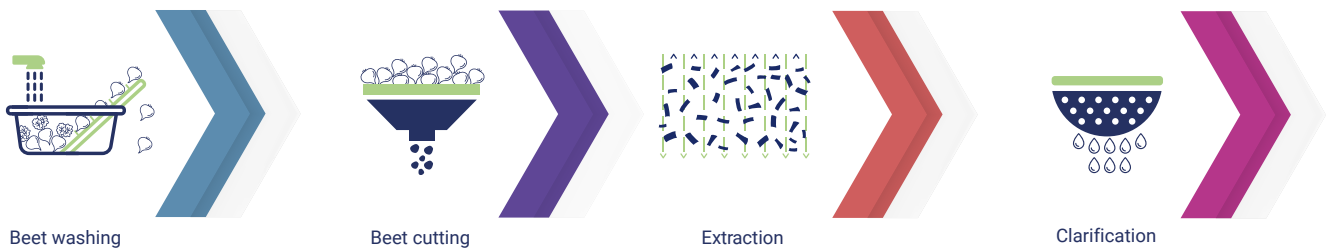
- higher energy costs
- higher colors due to longer retention times in the evaporation process
- additional downtime due to cleaning of the equipment

## DEFOAMER, ANTISCALANTS AND OTHER PROCESSING AIDS

Foaming and scaling issues limit the capacity and cause extra work for the factory staff as well as decreasing profitability. To prevent these negative effects, LEVACO developed the following antifoaming, antiscalants and processing aids for the food industry.



# SUGAR PROCESSING



## DEFOSPUM® BIO for organic production

Customers are looking for bio and organic products, and sugar factories are trying to keep up with the demand by increasing organic sugar production. To support them, LEVACO developed antifoaming agents suitable for the strict requirements of the organic production process.



## DEFOSPUM® antifoaming agents for beet washing

At the beet washing, surface-active substances like saponins, sugar, and degradation products are dissolved in the transport water, generating undesired foam. A so-called outside antifoaming agent is used to handle foaming in this cold process.



## DEFOSPUM® antifoaming agents for higher process temperatures

At the diffusion, extraction, carbonation, and evaporation processes the process temperatures are much higher than during the beet washing process. Therefore, these processes require different antifoaming agents: inside defoamers used here should have low surface tension, good dispersion character, and fast foam-breaking effects.



## DEFOSTAB® 220 natural biostabilizer to substitute formaldehyde

To fight bacteria and control lactic acid development, sugar factories used formaldehyde in the past, which is a hazardous chemical causing occupational health and handling issues. To offer a safe alternative to formaldehyde, LEVACO supplies a unique and sustainable natural biostabilizer produced from raw materials of native origin, listed as a processing auxiliary for conventional and organic sugar production. The DEFOSTAB® 220 biostabilizer can aid or replace formaldehyde to control lactic acid levels in various stages of sugar production, subsequently reducing sugar losses, enhancing occupational safety, and easier handling, not being a hazardous chemical





**DEFOFLOC® for more efficient sedimentation**

To enhance the performance of sedimentation tanks in carbonation, water treatment, and other processes, flocculating agents are used. We offer a wide range of anionic and cationic flocculants of different molecular weights.



**DEFOSCALE® against scaling**

Scale prevents effective heat transfer in the evaporator stages, leading to increased energy costs and product losses. DEFOSCALE® scaling inhibitor prevents the scale formation in evaporators caused by the presence of hardness components in the sugar juice.



**DEFOSPUM® pan aids for crystallization**

At the pans, a special antifoaming agent called pan aid is used to reduce the viscosity of the syrup, improving the rate of crystallization, thus decreasing energy consumption and increasing productivity.



**DEFOCLEAN® for chemical cleaning**

Once scale has formed, it needs to be removed by mechanical or chemical cleaning. DEFOCLEAN® products help to remove any type of scale, such as calcium oxalate, silicates, or sugar coal, in the most economical way. Their application is supported by our experienced experts.



# STARCH INDUSTRY

Starch is produced by processing different raw materials like potato, wheat, corn, peas and tapioca. All factories processing these raw materials face foaming issues at the starch extraction and protein recovery steps, while potato processing imposes even more challenges to overcome foaming problems.

The demand of the food and paper industry for starch as a basic ingredient is ever-growing. Natural fibres and proteins are also becoming more and more valuable and lucrative side-products of starch producers.

## PREPARATION OF THE RAW MATERIAL AND RASPING

### DEFOSPUM® antifoaming agent for

- Low temperatures (5-20°C)
- Inhomogen mixture of pulp, juice, starch

Before processing, the potatoes are washed through a water channel to remove soil, dirt, and other impurities. Then potatoes are peeled and cut by a saw blade rasp and mill grinded (rasping) to open the tuber cells and release the starch granules. The result is a mixture of pulp, potato juice, and starch. Turbulence, starches, and proteins are causing foaming issues, which can limit factory throughput and reduce process reliability. The process is typically rather cold (5-20°C), so an appropriate DEFOSPUM® antifoaming agent is used to destroy existing foam and inhibit the formulation of new foam.

## WET STARCH PROCESSING AND EXTRACTION

### DEFOSPUM® antifoaming agent for

- Medium / high temperatures (40-70°C)
- Wet starch process of cooking and screening

As the raw material is cooked in several steps, starch exudes and is extracted. Multiple screening steps separate the starch from the pulp, which can be reprocessed. Starch isolated by the screens or sieves is reslurried in water to remove soluble material and then dewatered in continuous centrifuges. In the 40-70°C processes of cooking and screening a DEFOSPUM® antifoaming agent should be applied to control foaming effectively.

## PROTEIN RECOVERY

### DEFOSPUM® antifoaming agent for

- High temperatures (50-90°C)
- Precipitation combined with heat treatment

Potato and other juices are complex mixtures of several components, making them a challenging feedstock for protein isolation. Undiluted juice contains up to 5% dry matter, and around 20-25% of this dry matter is protein. Industrial proteins are generally separated through three processes: Precipitation by adjusting physical properties of the solution, membrane separation, and chromatographic separation. These processes are used both separately and in combination. Typically, precipitation is preferred for proteins for feed/ food use and is often combined with heat treatment in the range of 50-90°C. During the separation processes, foaming can occur and a DEFOSPUM® antifoaming agent specially designed for high temperatures is selected.

## FOR ALL PRODUCTION STEPS

### DEFOSCALE® against scaling

Scaling prevents an effective heat transfer, resulting in increased energy costs. DEFOSCALE® prevents the formation of scaling in heat exchangers and evaporators, reducing energy consumption and saving CO<sub>2</sub> and costs.

### DEFOCLEAN® for plant cleaning

Chemical cleaning processes are used to remove organic and inorganic deposits. DEFOCLEAN® optimizes these processes. This makes the processes more effective and cost-efficient.



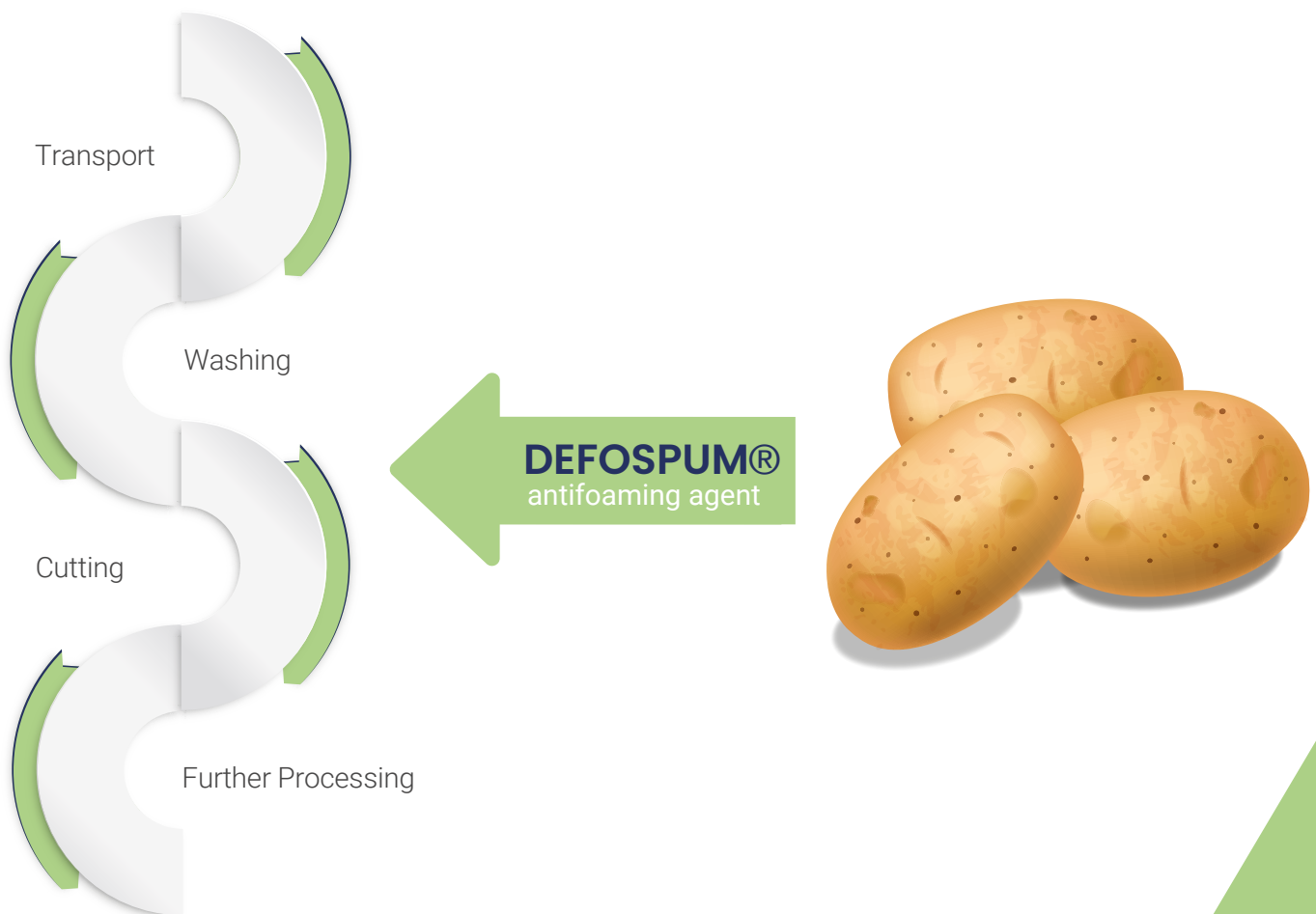


# POTATO PROCESSING

Potato processing often faces foaming issues. Proteins, starches, and other impurities escape the potato to the water while turbulence introduces air into the system, causing significant foaming.

Without using antifoaming agents, this foam often prevents the production process from running smoothly. The LEVACO team carefully selects the appropriate foam management solution and antifoaming agents to mitigate the foaming problem and ensure a safe and reliable process.

We look forward to making your production process foam-free, whether you peel, cut, mash, boil or fry.





## FERMENTATION

**In biotechnology, fermentation is used for the microbial conversion of organic substances into desired end products. A distinction is made between aerobic and anaerobic fermentation, while the best possible conditions must prevail for the microorganism to have an effective fermentation outcome.**

Depending on the fermentation process, **LEVACO** strives to destroy, prevent, or manage foaming with the help of our **DEFOSPUM®** antifoaming agents. The **LEVACO** team is known for its close cooperation with our customers. Each fermentation process is carefully discussed and observed before a tailor-made solution is provided. Joint product developments and large-scale trials in production facilities pose a particular challenge in fermentation processes, as production must not come to a standstill.

Scaling prevents an effective heat transfer, resulting in increased energy costs. **DEFOSCALE®** prevents the formation of scaling in heat exchangers, distillation units and evaporators, reducing energy consumption and saving CO<sub>2</sub> and costs.

Chemical cleaning processes are used to remove organic and inorganic deposits. **DEFOCLEAN®** optimizes these processes. This makes the processes more effective and cost-efficient.

Thanks to **LEVACO's** many years of experience, production stops can be avoided, and fermentation efficiency can be increased. We look forward to helping you mitigate foaming in fermentation, whether you produce amino acids, baker's yeast, enzymes, ethanol, citric acid, or pharma products.



# WATER TREATMENT

## **DEFOSPUM® antifoaming agent**

Foam formation occurs in various industrial water circuits and wastewaters and causes technical problems that lead to greater expenses and higher costs. Defoamers or antifoaming agents are chemical products suitable for reducing or preventing undesired foam formation. Whether municipal or industrial wastewater treatment, recycling, paint and coatings industries, automotive, paper or construction industries, LEVACO has the right defoamer for your application.

We develop defoamers based on our EO/PO polymers as well as other non-silicone and silicone raw materials suitable for all process temperatures from 5 to 100°C.!

## **DEFOSCALE® against scaling**

The prevention of scaling through the use of DEFOSCALE® comes into consideration wherever heat transfer surfaces are affected by deposits, expensive plant components such as pumps or sensors are to be protected from deposits, or the clogging of pipelines due to deposits leads to costly repairs. DEFOSCALE® effectively prevents the formation of scaling and thus ensures cost savings.

## **DEFOCLEAN® for plant cleaning**

DEFOCLEAN® optimizes chemical cleaning processes to remove organic and inorganic deposits. This makes them more effective and cost-efficient.

Contact our staff to select the right products for your process.



## LEVACO CHEMICALS GMBH

LEVACO Chemicals GmbH, with its headquarters and production site in Chempark Leverkusen, has decades of experience in the production of process chemicals for agrochemicals, the cable industry and food production, as well as in paper production, paints, coatings and construction materials. Another business area of **LEVACO Chemicals GmbH** is the production and modification of various specialty chemicals for well-known chemical companies.

We are a leading manufacturer of specialty chemicals and additives such as defoamers, dispersants, emulsifiers, wetting agents, flocculants and fixing agents.

An experienced and international team, with in-depth knowledge in the development, production and application of the products, serves customers around the globe.

LEVACO Chemicals GmbH is part of the **LEVACO Chemicals Group**, headquartered in Bremen, Germany, and is a globally positioned company with partners located worldwide. It combines **LEVACO Chemicals GmbH**, **LEVACO Austria GmbH** and **LEVACO Far East Ltd.** to form a future-oriented group of companies.





**LEVACO Chemicals GmbH**

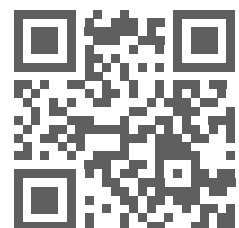
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